

Anses scientific and doctoral days

2 & 3 October 2023

Anses – Maisons-Alfort

Agora Building of the National
Veterinary School of Alfort (EnvA)



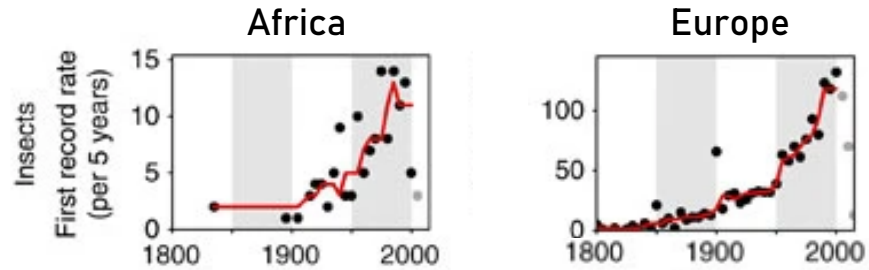
Identifying the specific status and geographical origin of European incursions of an invasive and cryptic pest, *Bactrocera dorsalis* (Diptera: Tephritidae)

Charbonnel Emeline

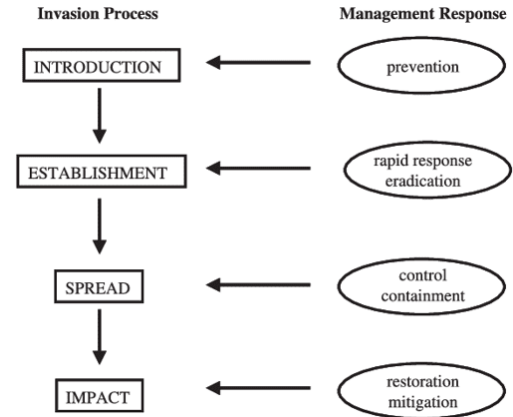
**Anses – Plant Health Laboratory –
Entomology and Botany Unit –
Montpellier**



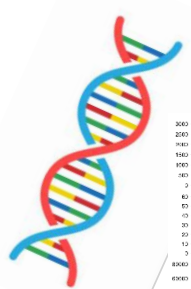
Biological invasions



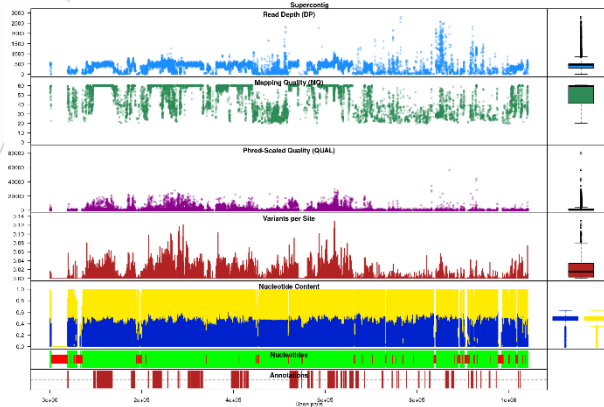
Temporal trends in continental first record rates. *Seebens et al. 2017*



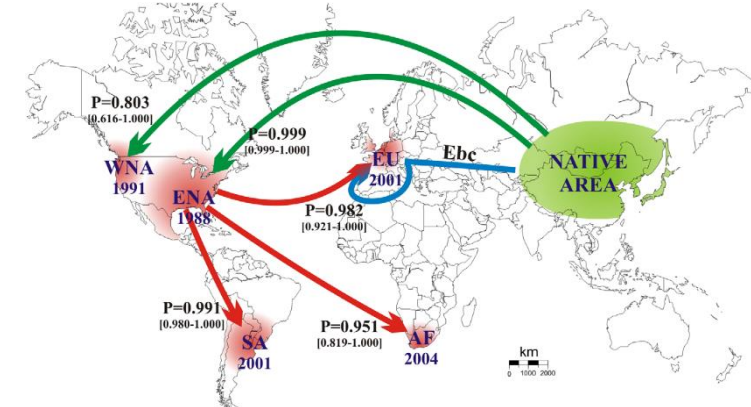
Stages and management of biological invasions



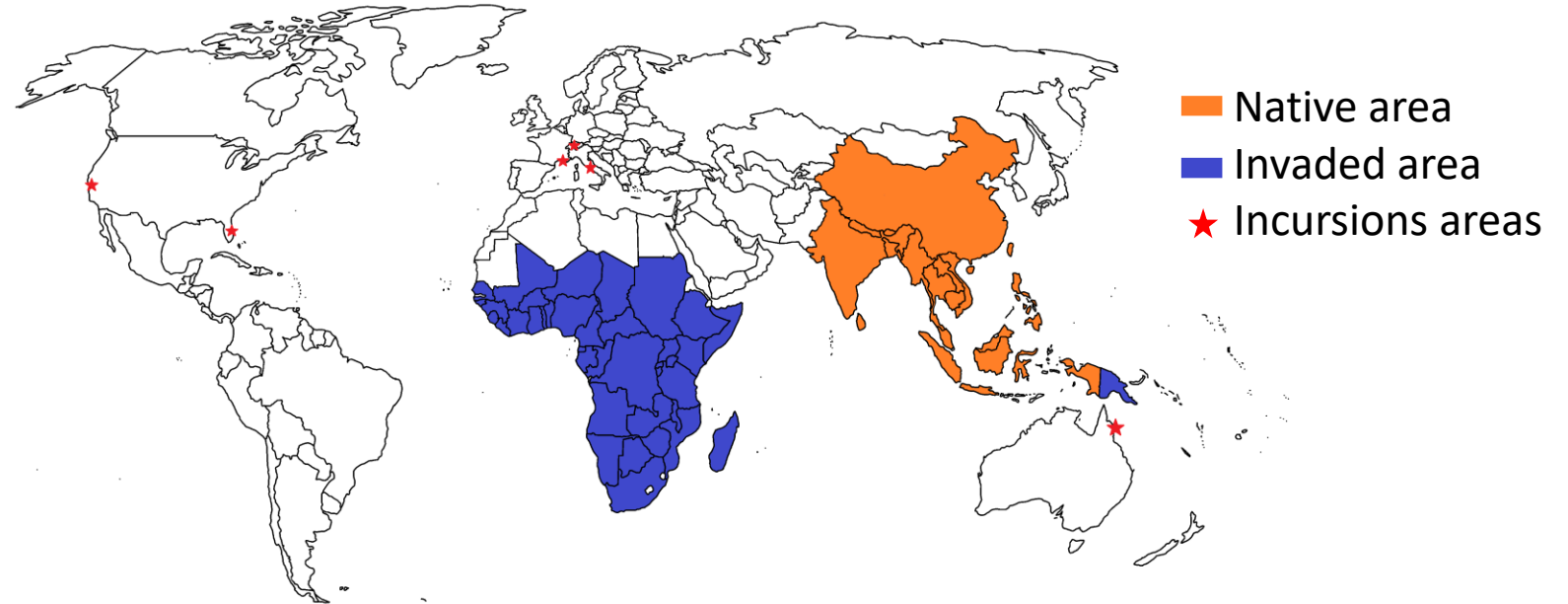
Population genomics



History of invasion



Bactrocera dorsalis – Oriental Fruit Fly



→ Priority among the Union quarantine pests

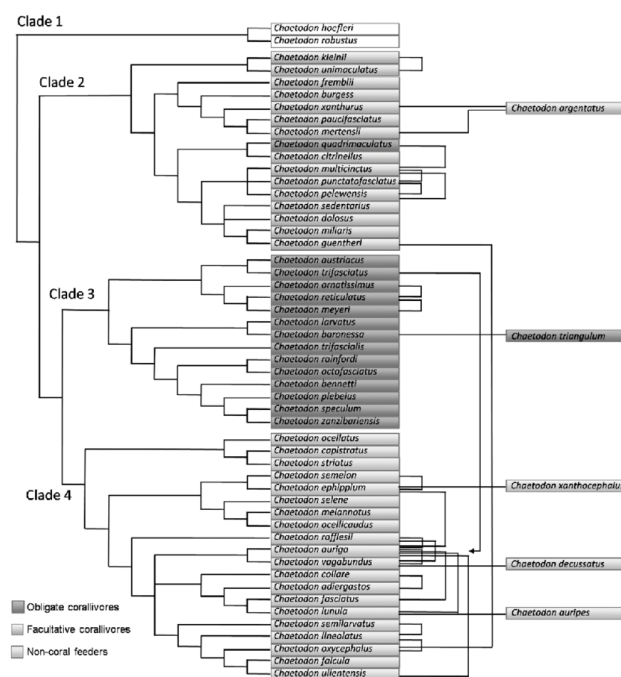
➔ Origin of European incursions ?



The *Bactrocera dorsalis* complex



Morphological similarities



Hybridization

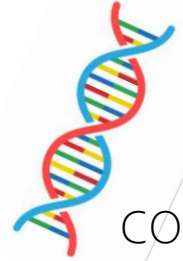


Methyl-eugenol lure

B. dorsalis identification protocol



+

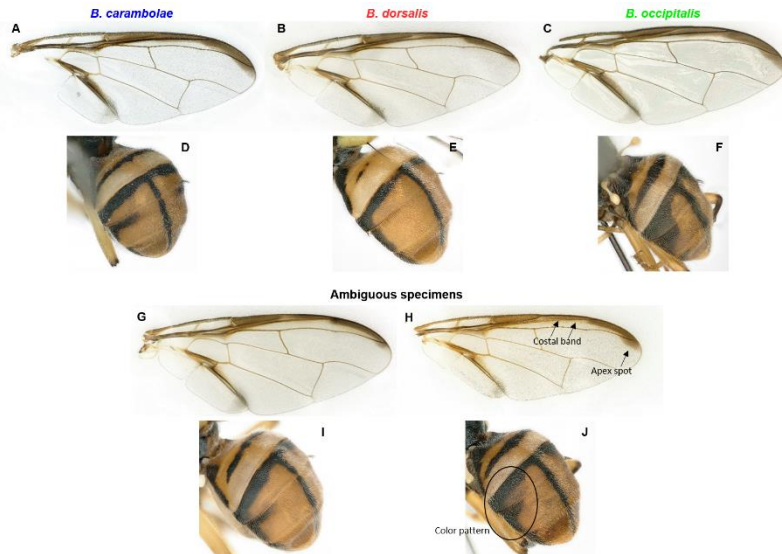


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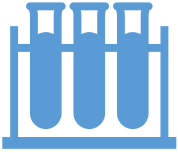
Journal of Economic Entomology

Evaluation of identification methods for cryptic *Bactrocera dorsalis* specimens: combining morphological and molecular techniques



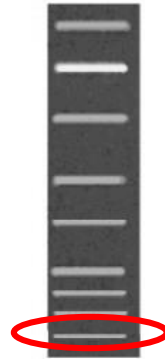
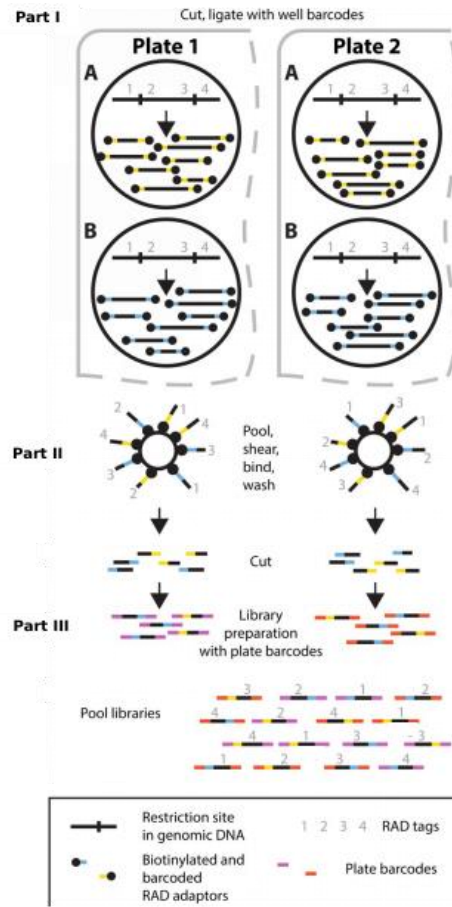
South East Asia _ *B. carambolae* & *B. dorsalis* & *B. occipitalis* confusions





Molecular protocol

Best-RAD (restriction-site associated DNA) protocol



molecular weight of 5-10kb



genotyping error < 0,05%

protocols.io

A FAIR protocol of the Best-RAD sequencing approach

Laure Benoit¹, Sabine Nidelet², Emeline Charbonnel¹, Marie-Pierre Chapuis¹

¹Centre de coopération Internationale en Recherche Agronomique pour le Développement;

²Institut National de la Recherche pour l'Agriculture, l'alimentation et l'Environnement

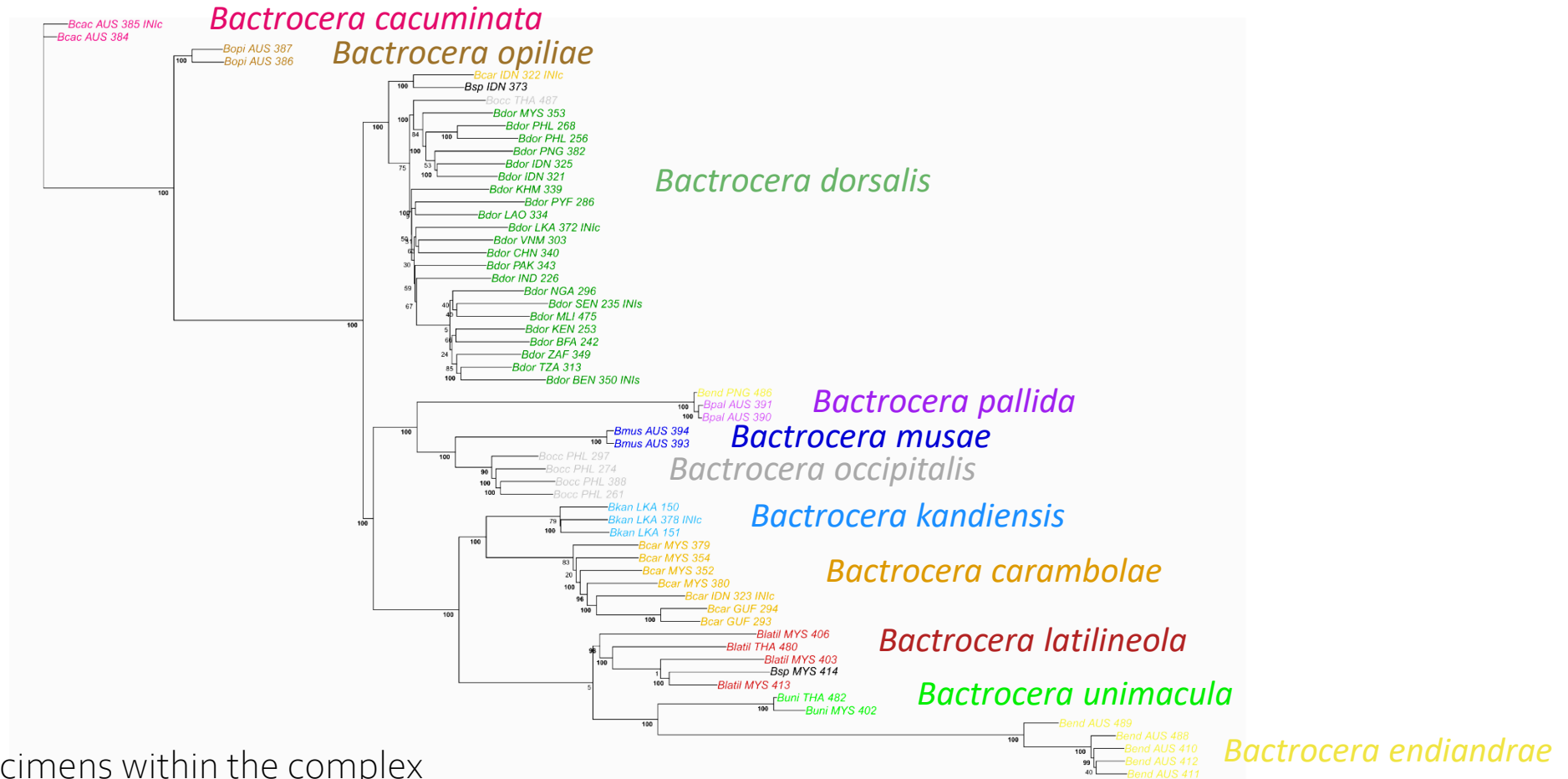
Protocol Info: Laure Benoit, Sabine Nidelet, Emeline Charbonnel, Marie-Pierre Chapuis . A FAIR protocol of the Best-RAD sequencing approach. [protocols.io](https://protocols.io/view/a-fair-protocol-of-the-best-rad-sequencing-approac-btpwnmpe) <https://protocols.io/view/a-fair-protocol-of-the-best-rad-sequencing-approac-btpwnmpe>

Laure Benoit

ABSTRACT

➔ Species delineation in the *B. dorsalis* complex

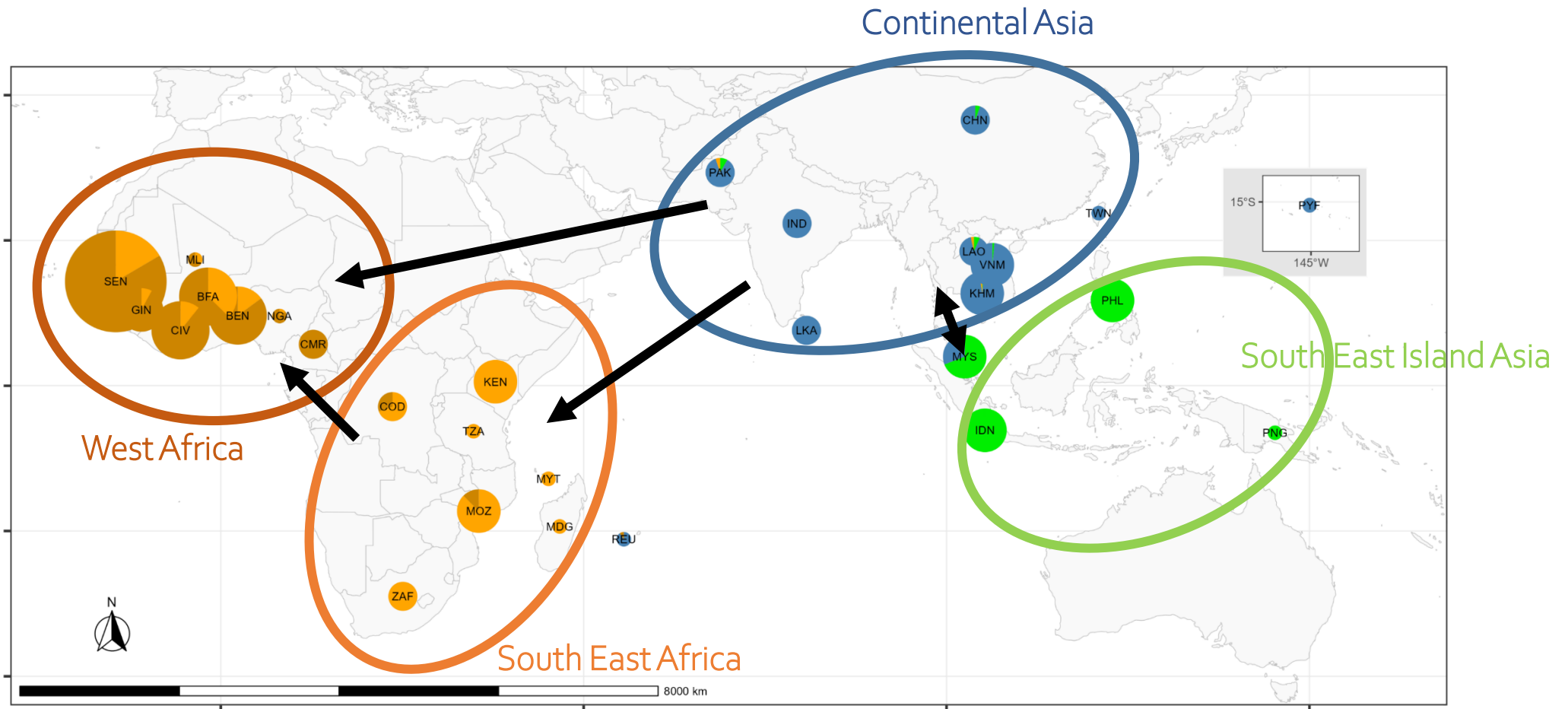
13 species _ 66 individuals in the *B. dorsalis* complex



- Identification of specimens within the complex
- No strong evidence of nuclear introgression

→ Phylogeography in *B. dorsalis*

84 worldwide *B. dorsalis* ss

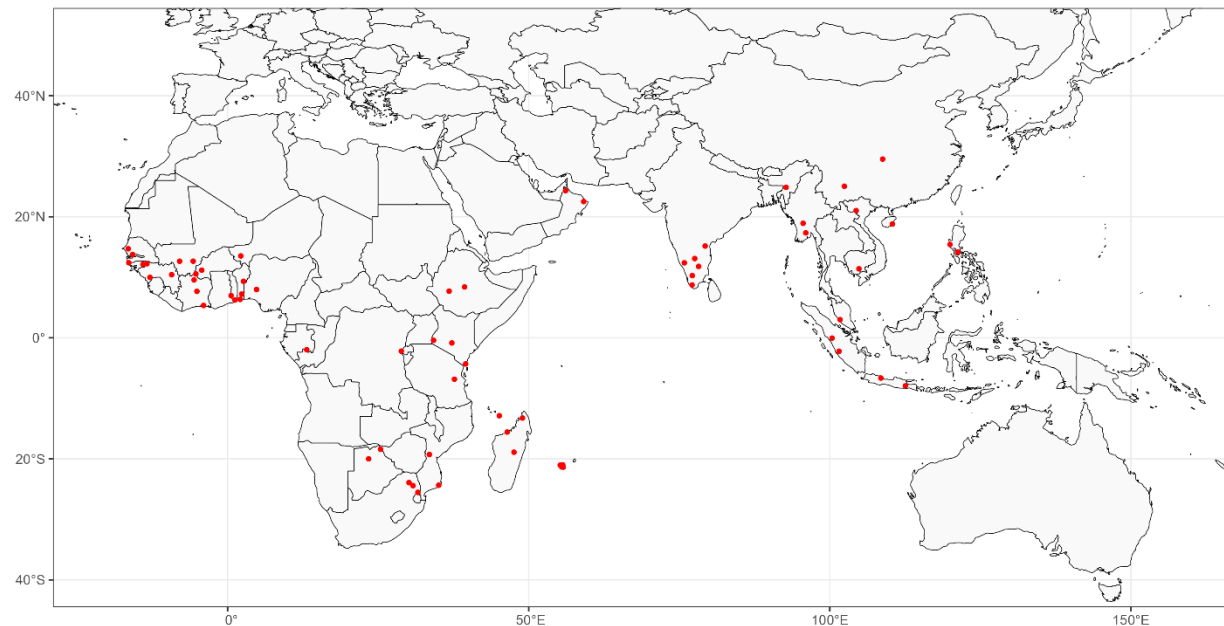




→ Refine genomic population structure + Inform geographical origin of incursions

19,678 nuclear probes to capture of specific loci of interest in *B. dorsalis*

70 *B. dorsalis* populations - 1950 individuals



+ 177 European incursions

